

What is claimed is:

- 1 1. A fixation device for holding a first plurality of pins extending into one or
2 more fragments of a fractured end portion of a bone and for holding a second
3 plurality of pins extending into a shaft portion of said fractured bone, wherein said
4 fixation device comprises a frame including:
 - 5 an arcuate portion including an arcuate inner surface and a first plurality of
6 holes extending radially from a center of said arcuate inner surface for holding
7 said first plurality of pins to extend inward radially toward said center of said
8 arcuate inner surface; and
 - 9 an elongated portion, extending in a first direction from said arcuate
10 portion, including an inner surface and a second plurality of holes for holding said
11 second plurality of pins to extend inward from said inner surface of said
12 elongated portion.
- 1 2. The fixation device of claim 1, wherein
 - 2 said first plurality of holes extend in first pattern and second patterns
3 displaced from one another in said first direction,
 - 4 holes within said first pattern are angularly displaced from one another
5 along said arcuate inner surface, and
 - 6 holes within said second pattern are angularly displaced from one another
7 along said arcuate inner surface.
- 1 3. The fixation device of claim 2, wherein holes within said second pattern
2 are disposed at angles between adjacent holes in said first pattern.
- 1 4. The fixation device of claim 1, wherein said second plurality of holes are
2 spaced apart in said first direction.

1 5. The fixation device of claim 1, additionally comprising a sliding pin holder
2 slidably mounted on said main plate and releasably clamped in place on said
3 main plate, wherein
4 a hole within said second plurality of holes extends within said sliding pin
5 holder, and
6 sliding said sliding pin holder in said first direction increases a distance
7 between a pin extending through said sliding pin holder and a pin extending
8 through each hole in said first plurality of holes.

1 6. The fixation device of claim 5, wherein
2 said elongated portion of said frame includes an elongated hole extending
3 in said first direction,
4 said sliding pin holder includes a nut sliding in said first direction within
5 said elongated hole and a sliding clamping screw with threads engaging said nut,
6 and
7 said hole extending within said sliding pin holder extends through said
8 sliding clamping screw.

1 7. The fixation device of claim 6, wherein an end of said sliding clamping
2 screw is divided into a number of flexible sections moving inward to engage said
3 pin extending through said sliding pin holder as said sliding clamping screw is
4 driven into engagement with said nut.

1 8. The fixation device of claim 7, additionally comprising:
2 a yoke removably attached to said pin extending through said sliding pin
3 holder; and
4 a setscrew engaging said yoke to move said frame opposite direction
5 relative to said pin extending through said sliding pin holder.

1 9. The fixation device of claim 1, wherein
2 each hole within said first plurality of holes includes an internally threaded
3 portion,
4 said fixation device additionally includes a pin-clamping screw within said
5 internally threaded portion of a hole within said first plurality of holes,
6 said pin-clamping screw includes a hole for holding a pin within said first
7 plurality of pins,
8 an end of said sliding clamping screw is divided into a number of flexible
9 sections moving inward to engage a pin extending through said hole within said
10 pin-clamping screw as said sliding clamping screw is driven into engagement
11 with said internally traded portion of said hole within said first plurality of holes.

1 10. The fixation device of claim 1, wherein
2 each hole within said second plurality of holes includes an internally
3 threaded portion,
4 said fixation device additionally includes a pin-clamping screw within said
5 internally threaded portion of a hole within said second plurality of holes,
6 said pin-clamping screw includes a hole for holding a pin within said
7 second plurality of pins,
8 an end of said sliding clamping screw is divided into a number of flexible
9 sections moving inward to engage a pin extending through said hole within said
10 pin-clamping screw as said sliding clamping screw is driven into engagement
11 with said internally traded portion of said hole within said second plurality of
12 holes.

1 11. The fixation device of claim 1, additionally comprising a plurality of
2 removably attached spacing blocks for holding said frame spaced away from a
3 body part to which said fixation device is attached.

1 12. A method for fixing one or more fragments of a fractured end portion of a
2 bone in place with respect to a shaft portion of said bone, wherein said method
3 comprises:

4 a) surgically inserting a first plurality of pins through holes within a first
5 plurality of holes extending within an arcuate portion of a fixture into said
6 fractured end portion of said bone, wherein said arcuate portion includes an
7 arcuate inner surface, and wherein said first plurality of holes extend radially from
8 a center of said arcuate inner surface;

9 b) clamping each pin within said first plurality of pins in place within a
10 hole within said first plurality of holes;

11 c) surgically inserting a second pin to extend through a hole within a
12 second plurality of holes in an elongated portion of said fixture to extend into a
13 shaft portion of said bone; and

14 d) clamping said second pin to extend through said hole within said
15 second plurality of holes.

1 13. The method of claim 12, additionally comprising, between steps b) and c),

2 e) surgically inserting a sliding pin to extend through a hole within a
3 sliding pin holder, mounted to slide along said main plate of said fixation device,
4 into said shaft portion of said bone;

5 f) after completing step c), sliding said sliding pin holder to establish
6 extension between bone fragments of in said fractured end portion of said bone
7 and shaft of said bone; and

8 g) clamping said sliding pin holder in a location established in step c)
9 to maintain said extension;

1 14. The method of claim 13, wherein step f) includes

2 attaching a yoke to said sliding pin; and

3 driving a setscrew to slide said yoke with said sliding pin and said sliding
4 pin holder relative to said elongated portion of said fixture.

1 15. The method of claim 14, additionally comprising removing said yoke from
2 said sliding pin.

1 16. The method of claim 13, wherein
2 step g) includes rotating a sliding pin clamping screw, engaging a nut
3 mounted to slide within an elongated slot in said first plate, in an engagement
4 direction,
5 rotating said sliding pin clamping screw in said engagement direction pulls
6 said nut to move into engagement with a surface of said elongated slot, clamping
7 said nut in place within said elongated slot, and
8 rotating said sliding pin clamping screw in said engagement direction
9 drives flexible sections of said sliding pin clamping screw inward to clamp said
10 sliding pin within a hole extending through said sliding pin clamping screw.

1 17. The method of claim 12, wherein step b) includes rotating a pin clamping
2 screw in engagement with a threaded portion of said holes within said first
3 plurality of holes to drive flexible sections of said pin clamping screw inward to
4 clamp each of said first plurality of pins within a hole extending through said pin
5 clamping screw.

1 18. The method of claim 12, wherein step d) includes rotating a pin clamping
2 screw in engagement with a threaded portion of said holes within said second
3 plurality of holes to drive flexible sections of said pin clamping screw inward to
4 clamp said second pin within a hole extending through said sliding pin clamping
5 screw.

1 19 The method of claim 12, wherein step d) is followed by removing a
2 plurality of removably attached spacing blocks for holding said frame spaced
3 away from a body part to which said fixation device is attached